

THE 16MM PROJECTOR

What an operator should know

NATIONAL FILM LIBRARY
DEPARTMENT OF EDUCATION
WELLINGTON 1983

FOREWORD

This is a completely revised issue of the 16mm projector booklet.

It includes recommendations from National Film Library registered examiners who train and test candidates for the National Film Library 16mm projectionist certificate.

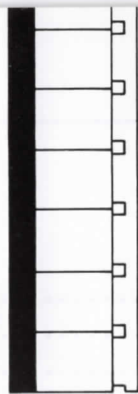
We hope that by following the instructions in this booklet projectionists will develop and maintain professional projection techniques and so ensure effective screenings and eliminate expensive film damage.

Kathleen C. Dear (Mrs)
Manager

1 March 1983

INDEX

	Page Number
Accessories	7
Breakdowns	14,15
Catalogues	3
Damage to Films	8,9,14,15
Faults	14
Focal Length Chart	16
Inching Knob	9
Lamps — Faults	14
Loops	9,14
Membership — NFL	1
New Films	12
Projectionist Certificates	15
Projectionist Examiners	16
Reels	7,9
Returning Films	2
Screen Placement	8
Screening Reports	11
Screens	8
Seating Arrangements	8
Servicing of Projectors	13
Setting Up	8
Sound — Faults	14
Splicing	12
Threading Up	9,10



*The National
Department of Education. It
to financial members.*

WHO MAY BORROW

Films are available to schools, colleges, educational institutions and community organisations having an educational purpose. Films are not available to individuals, for fund raising, entertainment or for social clubs. Films for an organisation must be relevant to its educational purpose, although general interest films may be included at the library's discretion.

MEMBERSHIP

Those wishing to borrow films should apply to the nearest library for a membership application form. The application must be approved and the subscription paid before films can be booked. Conditions of loan must be adhered to.

*Film Library is a part of the
lends 16mm educational films*

CONDITIONS OF LOAN

1. Films must be ordered in writing at least two weeks before the date of screening.
2. Films must be screened by a competent projectionist on a well maintained projector.
3. Borrowers may be held financially responsible for films damaged through faulty projection or for loss or damage due to inadequate custody or faulty packing or return.
4. FILMS MUST BE RETURNED TO REACH THE LIBRARY BY THE DUE DATE. The cost of return is the borrowers responsibility.
5. Borrowers must accept collect telegrams sent by the Library when films are not received back by the due date.
6. Films must be returned END OUT i.e. they must not be rewound after the final screening. To do this you will need one of each of the following size reels: 122m (400ft), 244m (800ft), 366m (1200ft), 488m (1600ft), so that there will always be the right size of reel to return the film in its correct box.
7. Members may not pass on their programmes to other users without first obtaining Library approval.
8. If an extension of the period of loan is desired applications should be made before the normal return date.
9. Films must be returned in their correct boxes and the National Film Library Screening Report completed and returned in the top film of the parcel. It also acts as a packing list when checking the issue back into the Library.
10. National Film Library titles are all subject to copyright and may not be copied by any means.
11. The Library reserves the right to cancel bookings and refuse further films to borrowers who do not comply with these conditions.

BRANCHES

- AUCKLAND** National Film Library,
Box 8729, Midland House,
67-77 Great North Road,
AUCKLAND.
- WELLINGTON** National Film Library,
Private Bag,
Courtenay Place Post Office,
Cubewell House,
15-17 Kent Terrace,
WELLINGTON 1.
- CHRISTCHURCH** National Film Library,
Box 319,
A.A.C. Building,
210 Hereford Street,
CHRISTCHURCH.

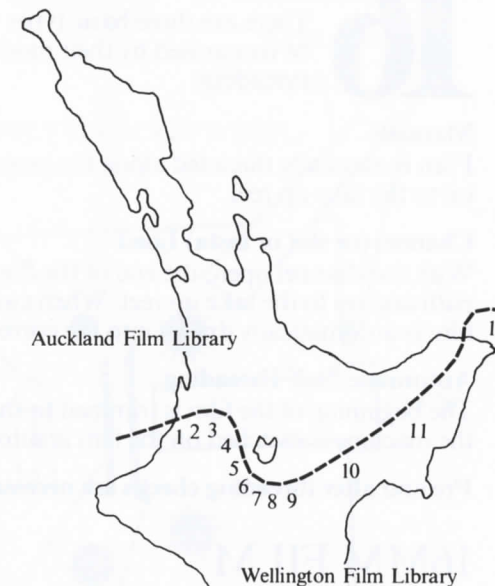
CATALOGUES

The catalogue and supplements may be purchased from government bookshops.
Catalogues list films by:
 subject classification
 alphabetically by title
and indicate the film content, running time, suggested audience levels and date of production.

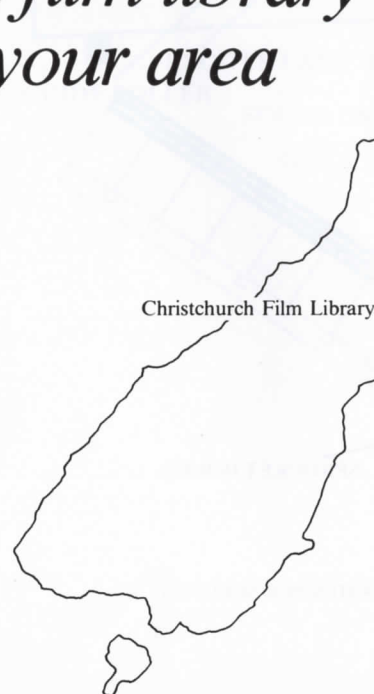
N.F.L. DISTRIBUTION AREAS

North Island Key

1. Awakino
2. Mahoenui
3. Paemako
4. Waimina
5. Taumarunui
6. Manunui
7. Ohakune
8. Waiouru
9. Tarawera
10. Onepoto
11. Rakauroa
12. Hicks Bay



*the film library
in your area*



16 MM PROJECTORS

There are three basic types which may be recognised by their mode of threading:

Manual

Film is manually threaded along the projection path around the drive sprockets and on to the take up reel.

Channel (or slot or insta) Load

With the channel open, the end of the film is led by hand through the recessed film path and on to the take up reel. When switched to 'forward' or 'project mode', the film is automatically drawn into the correct positions for projection.

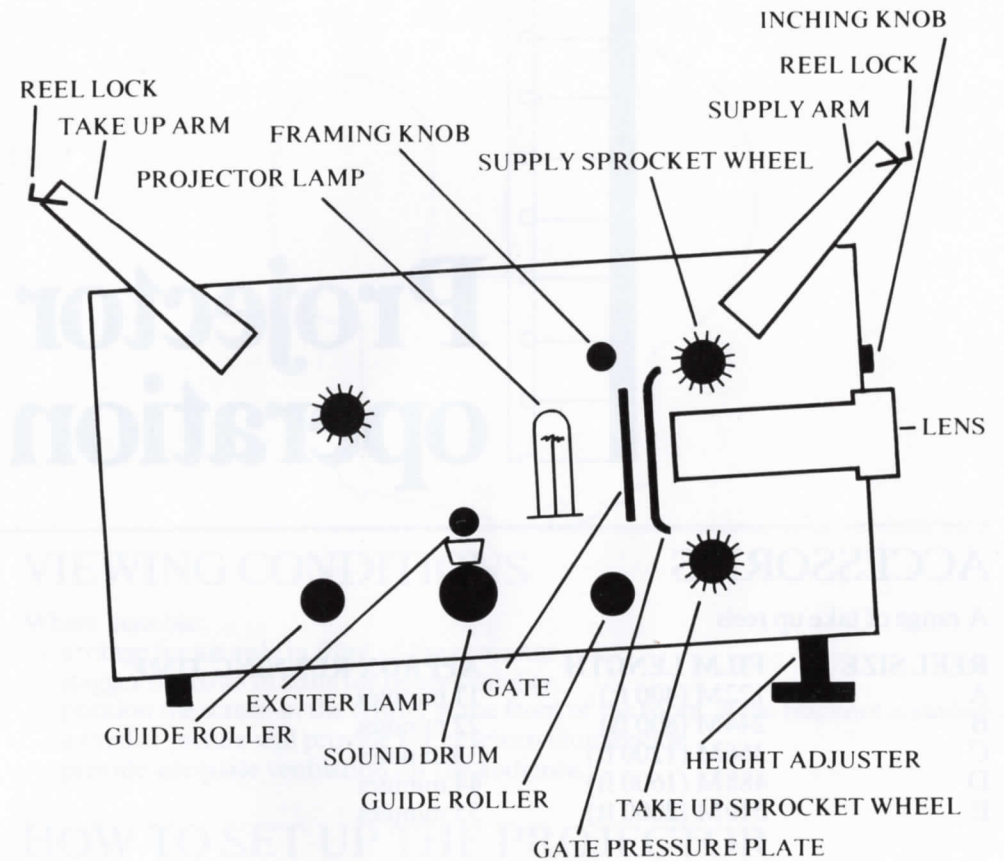
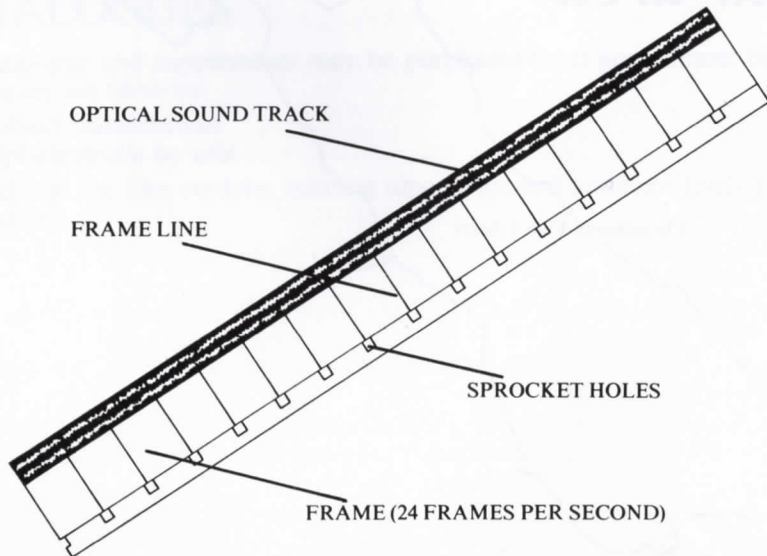
Automatic/Self Threading

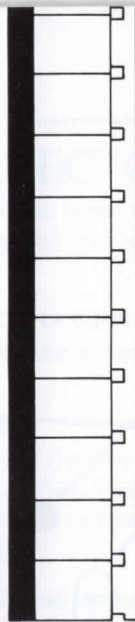
The beginning of the film is trimmed to shape and threaded into the projector. When the machine is switched on the film is automatically transported along the film path.

Pre and after threading checks are necessary for all makes and models.

16MM FILM

Film is easily damaged. See diagram for main characteristics.





Projector operation

ACCESSORIES

A range of take up reels

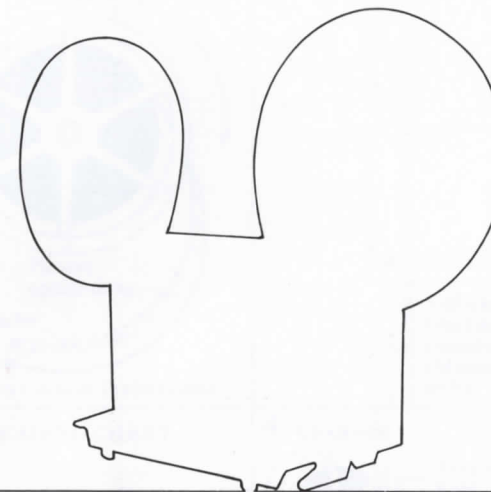
REEL SIZE	FILM LENGTH	APPROX RUNNING TIME
A	122M (400 ft)	11 minutes
B	244M (800 ft)	22 minutes
C	366M (1200 ft)	33 minutes
D	488M (1600 ft)	44 minutes
E	610M (2000 ft)	55 minutes

Spare lamps: a main projection lamp and exciter lamp. Make sure they are the correct type and power. Always quote the make and model of the projector when ordering spares.

Cleaning materials: a stiff bristle brush for the film path and pressure plate, and a blow duster to remove settled dust.

Lens tissues

Spare fuses.



VIEWING CONDITIONS

Where possible:

- arrange for an aisle in front of the projector
- stagger the rows of seats for better visibility
- position the screen in the centre, at the front of the room. If the blackout is inadequate a smaller picture will provide better screen illumination.
- provide adequate ventilation for the audience.

HOW TO SET UP THE PROJECTOR

1. Place the projector on a stand approximately one metre high.
2. Place the speaker near the screen facing the audience and above their heads.
3. Connect the speaker cord firmly to the projector and place the cord where the audience will not trip on it.
4. Connect the power cord to the plug and switch power on.

Testing

5. Switch on the amplifier.
6. Switch on the projector motor and projection lamp.
7. Align the projector and adjust elevation so that the picture area just fills the screen.
8. Make a preliminary focus, watching the edges of the picture area for dirt or fluff.
9. Test the amplifier by turning up the volume and passing the end of the film between the exciter lamp and the sound drum. There will be a plopping noise.

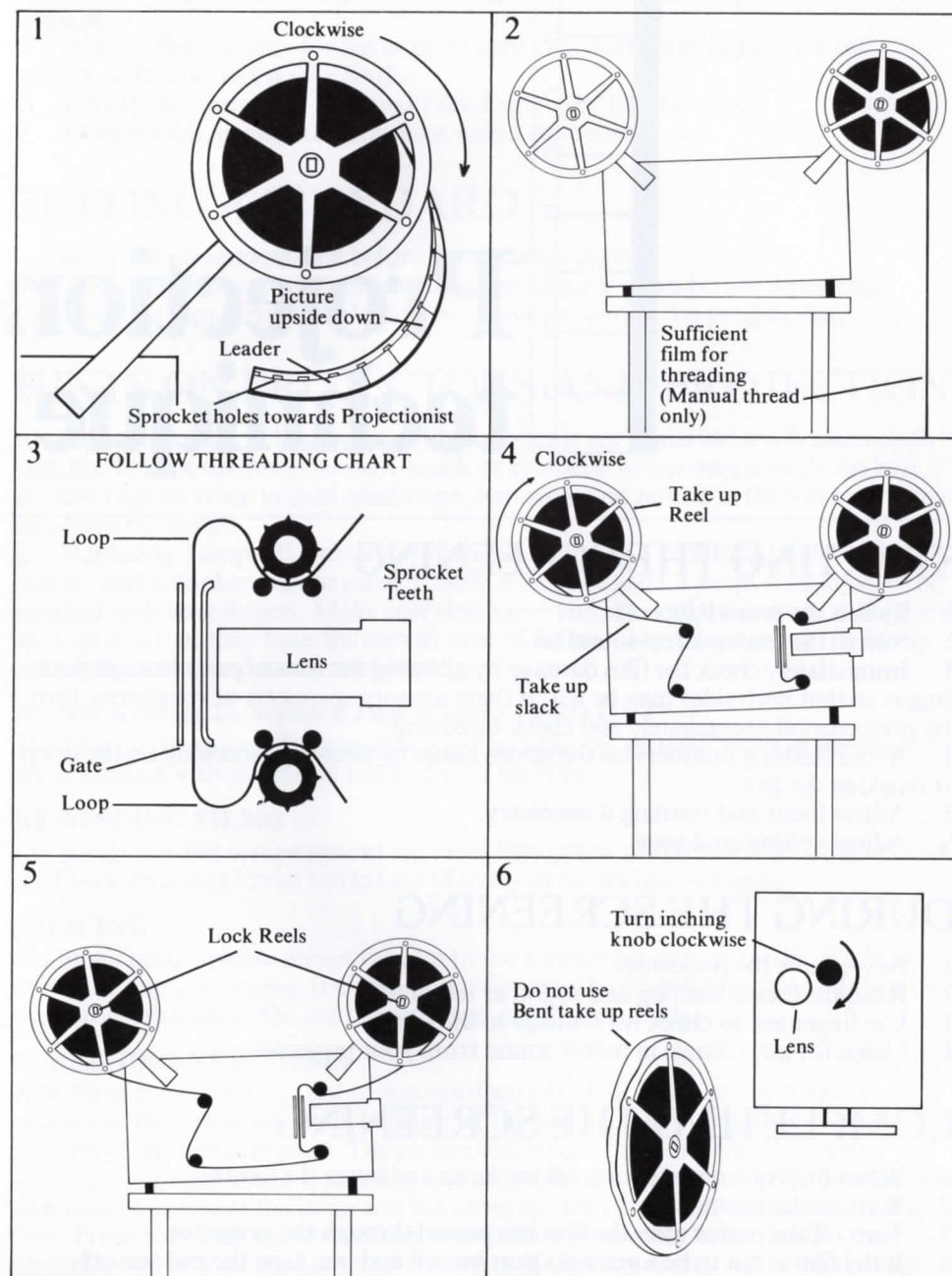
Cleaning

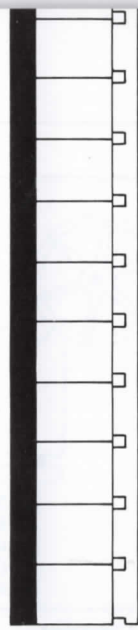
10. It is essential that the projector be cleaned before screening to avoid film

damage. Clean the film path thoroughly. This includes the aperture, sprocket teeth, and all rollers and the pressure plate. Particular care should be taken with the pressure plate. It may be necessary to remove accumulations of emulsion from the runners with a thumb nail. Never use a metal object. The lens must also be cleaned. A blow duster will remove settled dust.

THREADING

1. Make sure you have the correct film and that it is START OUT. Check that the film unwinds in a clockwise position, that the picture is upside down and the sprocket holes are on the side nearest to the projectionist.
2. Uncoil sufficient film leader to complete threading.
3. Follow the threading chart for your projector and make sure that the film seats correctly in the gate and sprocket teeth, and that adequate loops are provided at top and bottom.
4. Place the free end of the film in the take-up reel (clockwise) and get rid of any film slack by turning the take-up reel by hand.
5. Check both reels to ensure that they are not bent and that they are securely mounted on the projector arms.
6. Use the inching knob to check the threading before turning on the motor. The top and bottom loops must be of the correct size, and the film should move intermittently through the gate.





Projection technique

STARTING THE SCREENING

1. Switch the room lights off.
2. Switch the motor-lamp-sound on.
3. Immediately check for film damage by allowing the film to pass through your fingers so that both sides may be felt. If there are torn sprockets or roughness, turn the projector off immediately and check threading.
4. Avoid flashing numbers on the screen either by delaying switching on the lamp or masking the lens.
5. Adjust focus and framing if necessary.
6. Adjust volume and tone.

DURING THE SCREENING

1. Never leave the projector.
2. Readjust focus, framing and sound as required.
3. Use finger test to check for damage to the film.
4. Listen for any change in motor sound from your projector.

COMPLETING THE SCREENING

1. When final title appears turn off the lamp and lower the volume.
2. Turn on the room lights.
3. Turn off the motor **after** the film has passed through the projector.
4. If the film is not to be screened again leave it end out, tape the end securely,

replace it in its box, and **complete screening Report**, noting any problems or damage.

5. Allow a few minutes for the lamp to cool then dismantle and repack the projector. Disconnect power cord.
6. Return the film to the National Film Library by the due date.
7. Once cooled, protect the projector with a dust cover.

SETTING A STANDARD

- Set up the equipment well before the audience arrives.
- Check that all systems operate and the projector is clean before threading.
- Check for film damage and machine operation during the programme.

HINTS ON PROJECTORS AND PROJECTION

1. Cleaning lenses. If lens tissue or blow duster is not available, a soft clean cloth is suitable. Do not use material such as silk or synthetic which may scratch the lens. If the lens fogs up when in cold conditions, remove it and hold it in the warm stream of air above the lamp.
2. Replacing Lamps. If a projection lamp fails during a screening, it will be hot to handle, and a hankchief or piece of cloth should be used. Lamps should never be handled with bare fingers. Make sure that spare lamps are of the correct voltage and wattage and that they have the correct type of fittings. The lamps should fit firmly into their sockets and never need forcing.

Do Not Attempt To Screen a Film Which is "END OUT"

The film can be ruined if this is attempted because the sprocket teeth of the projector are in contact with the sound track edge of the film.

REWINDING FILMS

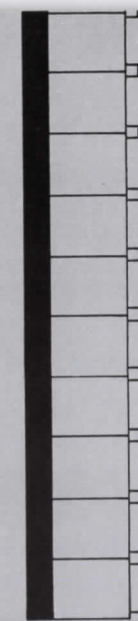
Do not let the film scrape against the reels. Straighten the reels before using or hold the film with a slight twist so that it will freely move without scraping.

SPLICING

If a break occurs please return the film to the Library for correct repair. If a break occurs during a screening, the ends of the film may be lapped together and then the projector rethreaded. Do not use cellotape or other methods.

SCREENING NEW FILMS

New films sometimes will not screen satisfactorily. This is due to the moisture content of the emulsion which makes it rather soft and likely to gather on the runners of the pressure plate. The picture will be unsteady and the film chatter will sound louder than usual. If cleaning and rethreading does not solve the problem the film may be run over the lamp and fan using the rewind system to slightly dry the film. Projectors with automatic loop resetters are potentially hazardous to these films. Do not rely on the automatic resetting of the loop as this will cause damage every foot or so.



Trouble shooting

STILL PROJECTION

This is never very satisfactory. The light intensity has to be reduced to avoid blistering the film and the resultant poor illumination gives little picture detail. If it is necessary to use still projection and a burn occurs, do not attempt it again as the safety shutter is not operating correctly.

DUST COVERS

Dust is the enemy of both projectors and of films. The projector should be protected with a dust proof sheet or plastic case. If the projector is hot, allow it to cool off.

VENTILATION

A stuffy room will not enhance your screening. Movement of air is important in a viewing situation.

YOUR PROJECTOR REQUIRES SERVICING WHEN

1. The projector causes film damage despite correct threading and usual checks.
2. There is an unsteady picture, not due to an accumulation of emulsion on the gate.
3. Motor speed is erratic.
4. Sound is inadequate or distorted.
5. It is a year since previous overhaul.

PROBLEM

WHAT TO DO

Motor Does Not Start

Check power supply, leads and fuse.

Lamp

Does not light but motor runs

Check lamp. Disconnect power. Do not finger the bulb. Check fuse.

Poor Illumination

Safety shutter not operating correctly.

Sound

None

Check amplifier switch, volume control, speaker sockets and amplifier fuse. Check exciter lamp. Clean exciter lamp aperture.

Muffled, Indistinct or Slow Sound

Check tension of film around the sound drum. Check that the projector is at the correct speed.

Motor boat noises

STOP. Check sound track for damage by sprocket perforation.

Picture

Light inadequate

Check safety shutter has not stuck. Check lamp for blackening. Inadequate blackout. Dirty lenses.

Film runs through

Lost loops. Switch off immediately. Rethread and test by manual advance.

Jumpy picture

Clean any build up of emulsion on the pressure plate. Worn intermittent claw. Check loops.

Part of adjoining frame at top or bottom of image	Adjust framing control.
Screen goes black during screening.	Check and replace projection lamp.
Screen goes white during screening.	Film broken. Rethread and lap ends of the film on the take up reel.
Furry edges of picture area.	Clean gate area thoroughly.
Film Transport Motor runs but sprockets not turning.	Release still (clutch) control.
Film scrapes on reel.	Stop and straighten reel sides.
Film not winding on to take up reel.	End of film may not be engaged in the reel. Check belt slip or rewind mechanism.

AUTOMATIC PROJECTORS

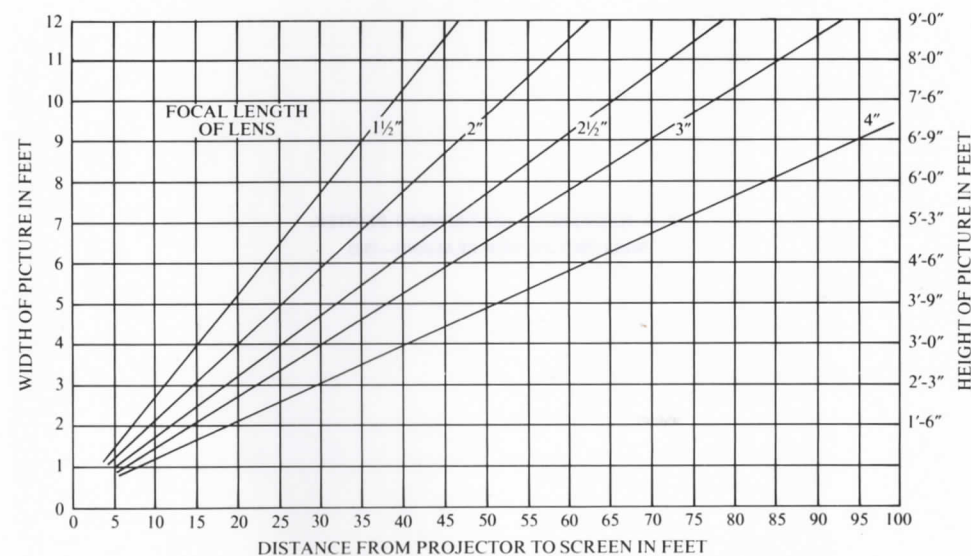
Careful attention must be paid to threading Automatic or Self-threading Projectors. The film leader **must** be trimmed by the cutting blade provided and it should also be free of damage such as creases and torn sprocket holes. The film should be fed **straight** into the threading path and not at an angle. Failure to strictly adhere to the above will result in severe film damage such as torn sprockets and pimpling (caused by film drifting over sprocket wheels).

PROJECTIONISTS' CERTIFICATES:

A Projectionist's Certificate will be issued by the National Film Library on the recommendation of a Projectionist Examiner. Candidates are expected to have a thorough knowledge of the contents of this booklet and to demonstrate that they are competent operators. In general, three periods of practical instruction of an hour each are required and, in addition, some further hours of experience in projecting. Circulars about this scheme are available from National Film Library, Private Bag, Courtenay Place P.O., Wellington, which will also supply a list of projectionist examiners for your district. Reels of practice film are available free of charge from branches of the library.

PROJECTIONIST EXAMINERS' CERTIFICATES will be granted on the recommendation of examiners who already hold this certificate. Candidates for the examiner's certificate, who are unable to arrange for recommendation by an examiner in their area, should write to the Manager, National Film Library, Wellington, stating their length of experience and the makes of projector they have used.

GUIDE TO SIZE OF SCREEN AND FOCAL LENGTH OF LENS



THIS CHART HAS NOT BEEN CONVERTED TO METRICS

P. D. HASSELBERG, GOVERNMENT PRINTER,
WELLINGTON, NEW ZEALAND—1983